WHAT IS CLAIMED IS:

1. A once-through evaporator for a steam generator, said evaporator comprising:

a supply header for receiving liquid water;

a discharge header spaced from the supply header for receiving steam;

tubes extending between and connected to the supply and discharge headers, so that water from the supply header may flow toward the discharge header and be converted to steam by heat to which the tubes are subjected; and

tapes in at least some of the tubes for inducing turbulence in a mist that is produced in such tubes as the water converted to steam in such tubes.

2. An evaporator according to claim 1 wherein each tape is twisted such that its edges form helices that lie along the interior surfaces of the tubes in which they lie.

3. An evaporator according to claim 2 wherein each tape has a length to diameter for a 360° twist of about 5 to 25.

4. An evaporator according to claim 1 wherein the tape is anchored at one end of the tube through which it extends.

5. An evaporator according to claim 2 and further comprising a bar extending transversely across each tube that contains a tape at the end of the tube at which it is anchored; wherein the bar is attached to the tube across which it extends; and wherein the tape for the tube is secured to the bar.

6. An evaporator according to claim 4 wherein each tape is anchored to the tube through which it extends at that end of the tube which is at the supply header.

7. An evaporator according to claim 2 wherein the width of each tape is less than the inside diameter of the tube through which it extends.

8. In a steam generator including a duct through which hot gases pass, a superheater and an economizer located in the duct, with the superheater being located upstream from the economizer with respect to the flow of the gases, a pump for delivering liquid water to the economizer, an improved once-through evaporator located in the duct between the superheater and the evaporator and being connected to the economizer and to the superheater such that water from the economizer flows into the evaporator which converts it into a mist flow and then into steam that is directed into the superheater where it leaves as superheated steam, said evaporator comprising:

tubes which lie within the duct so that the hot gases pass over them; and

a twisted tape located within each tube in the region of the mist flow.

9. The combination according to claim 8 wherein the tapes are twisted such that their edges form helices that lie along the inside surfaces of the tubes.

10. The combination according to claim 8 wherein each tape is anchored at one end of the tube through which it extends.

11. The combination according to claim 10 and further comprising a bar extended across and is secured to each tube at the end at which the tape is anchored; and

wherein the twisted tape in that tube is attached to the bar.

12. The combination according to claim 8 wherein the liquid water within each tube transforms into a mist and then into saturated steam; and

wherein the tape for the tube lies at least within the region of the mist.

13. The combination according to claim 12 wherein the twisted tape in each tube extends from the inlet and through at least the region of the tube in which the mist exists.

14. For use in a once-through evaporator, the combination comprising:

a tube having an inlet end and an outlet end; and

a twisted tape located within the tube and having helical edges that lie along the inside surfaces of the tube.

15. The combination according to claim 14 wherein the tape is anchored to the tube at one the ends of the tube.

16. The combination according to claim 14 wherein the tape possesses a length to diameter for a full 360° twist of 5 to 25.

17. The combination according to claim 14 wherein the width of the tape for each tube is slightly less than the inside diameter of the tube.

18. The combination according to claim 14 and further comprising water within one end of the tube and steam in the other end and a mist flow region between the water and the steam, and wherein the tape lies within the mist flow region.